

BUREAU of ENVIRONMENTAL HEALTH

KANSAS DEPARTMENT of HEALTH and ENVIRONMENT

2011 Harmful Algae Bloom Overview

The Harmful Algal Bloom (HAB) response coordinated by the Kansas Department of Health and Environment (KDHE) and assisted by other partners, seeks to expand the ability to notify the public of health concerns and track the rate and locations of toxic algae bloom incidence in the state. Response is designed to provide an investigation of HAB events reported to KDHE through an online data management form, then processed using a HAB database management system. Once a HAB complaint is validated and confirmed, the public is advised through various media outlets on what protective actions should be taken when visiting Kansas lakes.

Partners

A variety of committed partners work closely together sharing information, coordinating efforts and communicating a HAB response to the public. Collaborators include federal, state, local and academic partners who consistently confer on this issue. The Kansas HAB response partnership includes the following agencies: Kansas Department of Wildlife Parks and Tourism (KDWP&T), US Army Corps of Engineers, Kansas State University Veterinary Diagnostic Laboratory, Kansas State University Extension Office, US Geological Survey, Public Health Departments, Municipalities, County Parks and Recreation departments, Kansas Department of Agriculture (KDA) and Kansas Water Office (KWO). Established rapport is the foundation of our partnership as we work toward a common goal.

2011 PUBLIC HEALTH SUMMARY

GOAL: Prevent or reduce illnesses, injury and death related to HAB.

Current Activities and Significant Accomplishments

- KDHE is working with public health agencies, universities, federal and state partners to communicate with the public about HAB in public water bodies.
- The 2011, HAB Response Plan outlines the procedures to assist the public, partners and decision makers regarding educational information and public notices on lake conditions. Summary of HAB Response includes:
 - KDHE, KDWP&T, Army Corps of Engineers are notified of HAB
 - KDHE, Bureau of Environmental Field Services (BEFS); Army Corps of Engineers, or KDWP&T staff dispatched for collection of samples
 - If HAB observed, water samples taken
 - Blue-green algae identified
 - Microcystin toxin testing performed by KDHE, BEFS
 - Stakeholders convene through weekly conference calls
 - Public health advisory/warning issued if indicated and public water suppliers are notified and offered technical assistance
 - Communication via Health Alert Network
 - Press release

Current Activities and Significant Accomplishments - Continued

- In 2011, KDHE revised the 2010 HAB policy for public health protection actions. In the United States there are currently no federal guidelines for monitoring recreational hazards associated with cyanobacteria; however, many states have established guidance values for determining certain measures to protect the public's health. The World Health Organization (WHO) has established guideline values for exposure to cyanobacteria, including microcystin toxin, for recreational activities. These guidelines serve as a reference for KDHE recommendations for posting either a Public Health Advisory or Public Health Warning, which is an assessment of the level of risk based on testing results, to recreational water users when a blue-green algae bloom has been identified.

Table 1:1 KDHE HAB Policy

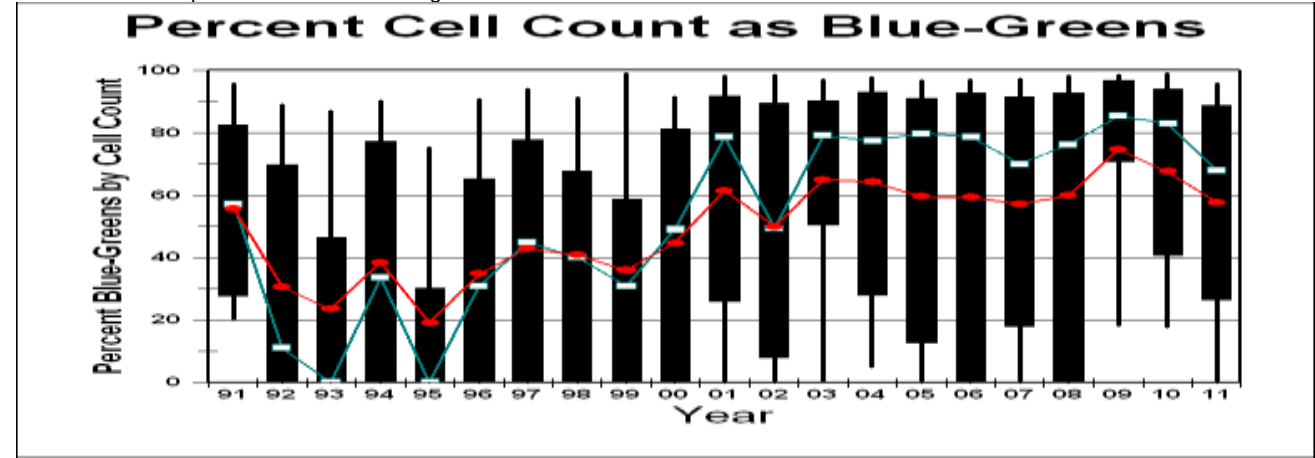
Condition	Alert Level	Recommended Action
<ul style="list-style-type: none">• Microcystin toxin detectable to ≥ 4 to <20 ug/L or• 20,000 to 100,000 cells/mL	Public Health Advisory	<ul style="list-style-type: none">• Post signage• Discourage direct contact• Notify LHDs, healthcare providers, veterinarians• Notify public water suppliers• Issue media release• Re-test within 4 weeks
<ul style="list-style-type: none">• Microcystin toxin ≥ 20 ug/L or• 100,000 cells/mL	Public Health Warning	<ul style="list-style-type: none">• Post signage• Prevent direct contact• Notify LHDs, healthcare providers, veterinarians• Notify public water suppliers• Issue media release• Re-test within 1 week

- In 2011, use of the online HAB Database Management System was refined and improved to streamline response and testing of a HAB complaint in public waters.

Public Health Impact

In Kansas, 22 of 26 state parks are adjacent to federal and state reservoirs with an estimated 6,100,000 visits to these parks in 2011. In 2011, 26 Kansas lakes and 19 counties were confirmed with harmful algae blooms. From March 18, 2011 to October 31, 2011, sixteen lakes were placed under a Warning status and there was one lake closure. Table 2:1 represents KDHE's annual ambient water database which tracks available nutrients and the trophic state of Kansas public waters, therefore; this is a reasonable cross section of lakes around the state. Trends should not be due to a change in what we are sampling but due to changing conditions in those lakes. The data indicates there has been an increase in total biomass cell count, blue green cell count, and the percent of the total due to blue-greens over time.

Table 2:1 KDHE reported cell count as blue-greens



LEGEND	
•	Mean Year
—□—	Median Values

Methodologies

- Letters were sent to healthcare providers and veterinarians
- An investigation is initiated for each report for public water bodies to determine the source of exposure and to initiate public health protective actions.
- HAB-related illness reported via phone call or online complaint form
- KDHE Epidemiologist reviews each report
- Field staff from either KDHE or through our collaboration are dispatched to visualize HAB; if HAB present, water samples are collected for cyanobacterial identification and toxin testing
- KDHE utilizes the CDC case definitions for harmful algal bloom-related illness.

Results-Human Cases

- There were 34 reports of human and animal HAB associated illness:
- June 1st – October 1st, 2011
- Human cases (n = 13)
 - 1 suspect
 - 5 probable
 - 7 confirmed
 - 71% (5/7) from one reservoir
- Confirmed Human Cases
 - Median age, 40 years (range 17-63)
 - 71% (5/7) male
 - 29% (2/7) hospitalized
 - No deaths

Results-Human Cases - Continued

- Primary symptoms
 - 71% (5/7), eye and upper respiratory irritation
 - 29% (2/7), rash
 - 14% (1/7), gastrointestinal
- Not a case (n = 13)
 - No other etiologies ruled out

Results-Animal Cases

- Animal cases (N = 7)
 - 1 suspect
 - 1 confirmed
 - 1 not a case
 - 5 dog deaths, All from one reservoir
- Confirmed Animal Cases
 - Median age; 1 year (range 4 months – 6 years)
 - 57% (5/7), male
 - 75% (3/4), neutered
 - Median weight; 51 lbs (range 40 – 60 lbs)
 - Onset of clinical signs; 2.5 hours (2-4 hours)
 - Gastrointestinal (vomiting, diarrhea)
 - Lethargy, staggering
 - Seizure

2011 Environmental Summary

Goal: Nutrient reduction in streams, lakes and reservoirs

Preventive Efforts

The Bureau of Water and Bureau of Environmental Field Services continue to work for nutrient reductions from point and non-point sources located in the watersheds of lakes and reservoirs, including those afflicted with HABs in 2011. Ongoing monitoring of streams help locate watersheds contributing large nutrient loads to downstream waters. Point sources, governed by conditions in their National Pollutant Discharge Elimination System (NPDES) permits, are working toward installing nutrient removal technology to lessen the phosphorus and nitrogen content of their wastewater discharged to streams and lakes. Watershed plans crafted by local and regional Watershed Restoration and Protection Strategy groups, direct Best Management Practices toward abating nutrient loads coming from unpermitted non-point sources such as cropland, livestock, septic systems and runoff from small towns. Total Maximum Daily Loads (TMDLs) establish

appropriate nutrient load levels for lakes suffering from eutrophication (excessive enrichment by nutrients) which can often spur HABs. While water quality planning is setting the stage for nutrient reduction goals that benefit lakes, implementation of those plans is the key to success, requiring time, financial resources and a willingness by land stewards to participate in the programs designed to reduce the loading of nutrients into Kansas waters. A multi-agency nutrient reduction framework continues to guide application of those programs, as well as setting priorities among Kansas watersheds for financial assistance and seeking ways to bolster that assistance through increased funding.

Summary of 2011

In Kansas, the first full year of focused HAB response and observation occurred in 2011. KDHE noted that each lake and bloom was unique and HAB cell concentrations and Microcystin toxin levels were related but not linear. Since, KDHE does not test private lakes or ponds, a partnership with Kansas State University Diagnostic Laboratory produced a methodology for testing private water bodies for blue-green algae cell counts. Undoubtedly, HAB is a threat to human and animal health in Kansas. Vital partnerships including federal, state, local and academic are essential in performing HAB response activities that support our common goal to protect and improve the health and environment of all Kansans.